

Summary Report of the World Trade Center Technical Review Panel Meeting

July 12, 2005

FINAL: 8/03/05

Prepared for:

Office of the Science Advisor
U.S. Environmental Protection Agency
Washington, DC

Prepared by:

Eastern Research Group, Inc.
110 Hartwell Avenue
Lexington, MA 02421

NOTICE

This report was prepared by Eastern Research Group, Inc., an EPA contractor, as a general record of discussion during the eleventh meeting of the World Trade Center Technical Review Panel held July 12, 2005, at St. John's University. This report captures the main points and highlights of the meeting. It is not a complete record of all details discussed, nor does it embellish, interpret, or enlarge upon matters that were incomplete or unclear. Statements represent the individual view of each meeting participant, and may or may not represent the analyses or positions of EPA.

CONTENTS

ACRONYMS AND ABBREVIATIONS	ii
EXECUTIVE SUMMARY	iii
1. INTRODUCTION	1
1.1 Panel Attendees.....	2
1.2 Purpose and Agenda	2
2. WELCOME, PURPOSE, AND OPENING REMARKS	3
3. EPA PRESENTATION ON FINAL DRAFT SAMPLING PLAN.....	3
4. WTC COMMUNITY/LABOR COALITION PRESENTATION	5
5. PANEL DISCUSSIONS	6
5.1 WTC Proposed Sampling Program: Success Requires Restructuring of Program Objectives and Sampling Methodology.....	6
5.2 OSHA’s Role in Worker Exposure to WTC Contamination	8
5.3 NIOSH’s Role in Worker Exposure to WTC Contamination.....	9
6. UPDATE ON WTC SIGNATURE STUDY AND DISCUSSION.....	10
7. AN UPDATE ON THE WORLD TRADE CENTER HEALTH REGISTRY: POST- ENROLLMENT ACTIVITIES	12
8. UPDATE ON BUILDING DECONSTRUCTION ACTIVITIES	14
9. NIEHS PRESENTATION ON WTC RESEARCH ACTIVITIES: EXPOSURE ASSESSMENT AND HEALTH EFFECTS.....	16
10. PUBLIC COMMENTS.....	17
11. CLOSING REMARKS.....	18
ATTACHMENT A: AGENDA	
ATTACHMENT B: PUBLIC COMMENTS	

ACRONYMS AND ABBREVIATIONS

CDC	Centers for Disease Control and Prevention
CLC	Community-Labor Coalition
COPC	contaminants of potential concern
DOHMH	Department of Health and Mental Hygiene
EPA	U.S. Environmental Protection Agency
FACA	Federal Advisory Committee Act
f/cm ²	fibers per square centimeter
HAZWOPER	Hazardous Waste Operations and Emergency Response
HHE	Health Hazard Evaluation
HVAC	heating, ventilation, and air conditioning
MMVF	man-made vitreous fiber
NIEHS	National Institute of Environmental Health Sciences
NIOSH	National Institute for Occupational Safety and Health
NYC	New York City
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbon
PEL	permissible exposure limit
PTSD	post-traumatic stress disorder
TWA	time-weighted average
USGS	U.S. Geological Survey
WTC	World Trade Center

EXECUTIVE SUMMARY

After the collapse of the World Trade Center (WTC) and the subsequent release of contaminants into the environment, the U.S. Environmental Protection Agency (EPA), other federal agencies, New York City (NYC), and New York State public health and environmental authorities focused on numerous cleanup, dust collection, and ambient air monitoring activities to ameliorate and better understand the human health effects of the disaster. While these monitoring and assessment activities were ongoing, EPA began planning for a program to clean and monitor residential apartments. Residents were eligible to request federally funded testing and/or cleaning of their residences. The cleanup continued into the summer of 2003, by which time EPA had cleaned and monitored 3,400 apartments and monitored an additional 800 apartments.

Since then, EPA convened a technical panel of experts who have been involved with the WTC assessment activities to provide advice on the effectiveness of these and related programs. Tim Oppelt, Acting Assistant Administrator of EPA's Office of Research and Development, serves as the interim chairperson, and Paul Lioy, Professor of Environmental and Community Medicine at the Environmental and Occupational Health Sciences Institute of the Robert Wood Johnson Medical School-University of Medicine and Dentistry, New Jersey and Rutgers University, serves as vice chair. This report summarizes the eleventh technical panel meeting in New York City, held at St. John's University on July 12, 2005.

Mr. Oppelt facilitated the meeting and presented the agenda, which consisted of:

- Welcome, Purpose of Meeting, and Opening Remarks
- EPA Presentation on Final Draft Sampling Plan
- WTC Community/Labor Coalition Presentation
- Panel Discussion
- Morning Public Comment Period
- Update on WTC Signature Study and Discussion
- Update on Building Deconstruction Activities
- NIEHS Presentation on WTC Research Activities: Exposure Assessment and Health Effects
- Afternoon Public Comment Period
- Closing Remarks

The following are key suggestions and conclusions expressed during the meeting:

Comments on the WTC Sampling Plan

- EPA believes that the current sampling plan is scientifically based and will achieve the objectives EPA was asked to determine. Because the data are limited, EPA would like to finalize the draft plan and start sampling as soon as possible. EPA acknowledged that there are aspects of the plan that the community has not accepted.
- A panelist suggested that the objectives of the sampling plan be revised to say, "to estimate the geographic extent of remaining WTC contaminants of potential concern."

- A panelist said that the current sampling plan contains “fundamental, serious flaws” that will lead to finding contamination, but then not doing anything about it. The WTC Community-Labor Coalition (CLC) expressed their commitment to continue to work with EPA to correct these flaws and salvage the program.
- Two panelists suggested restructuring the sampling plan’s objectives and methods for building selection. Some of the changes include (1) offer cleanup to all units that participate in the initial sampling, (2) build in the constraints of building type and heating, ventilation, and air conditioning (HVAC) role into the sampling design, and (3) form a subcommittee to design an appropriate sampling strategy that takes the known variables into account.
- A panelist continued to be skeptical that spatially balanced sampling is applicable to the WTC scenario.
- The WTC CLC presentation highlighted several suggestions made by the coalition that were not addressed by EPA, including decisions about access, the geographic extent for sampling, the sampling design, the list of contaminants of potential concern (COPCs), definitions of accessibility, cleanup benchmarks, HVAC sampling, and soft surface testing.

Comments on the WTC Dust Signature

- The purpose of the signature method validation study was to determine whether it is possible to distinguish WTC dust from background. The preliminary results indicate that slag wool is a good screening tool for identifying whether dust has been impacted by the WTC collapse.
- The community does not want to participate without a validated WTC signature.
- A few panelists felt that the WTC signature should not be linked to the policy decisions about whether cleanup is going to be offered.
- The community expressed disappointment that the peer review of the WTC signature method is not a full and transparent public process.

Comments on Involvement by the Occupational Safety and Health Administration (OSHA) and the National Institute for Occupational Safety and Health (NIOSH)

- A few panel members do not think that OSHA and NIOSH can be as responsive to workers’ needs, nor as protective of their exposures to WTC contamination, as EPA. They believe it is inappropriate to set a double standard for workers.
 - OSHA’s Hazardous Waste Operations and Emergency Response (HAZWOPER) 29CFR1910.120 standard does not apply to the WTC cleanup operations.

However, if employees are being exposed to a serious hazard, OSHA would respond to worker complaints under the general duty clause, with on-site inspections of the employees' work sites. The results from personal air sampling of employee's breathing zone would be compared to permissible exposure limits (PELs). Employers would be required to provide an appropriate level of protection to their employees if the levels are above the PELs.

- NIOSH conducts occupational health and safety research and workplace evaluations as part of the Health Hazard Evaluation (HHE) program. HHEs are epidemiological and hygiene evaluations of specific work sites that result in non-binding health and safety recommendations, based on the appropriate occupational and health and safety criteria. Because the HHE program has not been given resources to address WTC worker issues, NIOSH would respond to WTC-related requests as part of their regular work.

Miscellaneous Comments

- The EPA Region 2 office is in the process of hiring a full-time community involvement coordinator to work closely with the community and encourage community involvement and participation.
- A panelist commented that there is a lot of frustration and misinterpretation during these panel meetings and suggested hiring a facilitator.

1. INTRODUCTION

After the collapse of the World Trade Center (WTC) and the subsequent release of contaminants into the environment, the U.S. Environmental Protection Agency (EPA), other federal agencies, New York City (NYC), and New York State public health and environmental authorities focused on numerous cleanup, dust collection, and ambient air monitoring activities to ameliorate and better understand the human health effects of the disaster. While these monitoring and assessment activities were ongoing, EPA began planning for a program to clean and monitor residential apartments. Residents were eligible to request federally funded testing and/or cleaning of their residences. The cleanup continued into the summer of 2003, by which time EPA had cleaned and monitored 3,400 apartments and monitored an additional 800 apartments. Since then, EPA has developed a draft final sampling plan to study the contamination and recontamination of spaces in lower Manhattan and a portion of Brooklyn that may have been contaminated by the WTC disaster.

EPA convened a technical panel of experts who have been involved with the WTC assessment activities to provide advice on the effectiveness of these and related programs. Timothy Oppelt, Acting Assistant Administrator for EPA's Office of Research and Development, serves as the interim chairperson, and Paul Liroy, Professor of Environmental and Community Medicine at the Environmental and Occupational Health Sciences Institute of the Robert Wood Johnson Medical School- University of Medicine and Dentistry, New Jersey and Rutgers University, serves as vice chair. Members of the panel include representatives from the federal agencies directly involved in the air quality response and monitoring, the NYC Departments of Health and Environmental Protection, and outside experts.

EPA's goals in forming this panel and holding this series of meetings are:

- To provide for greater input on continuing efforts to monitor the situation for New York residents and workers impacted by the collapse of the WTC towers.
- To help guide EPA's use of the available exposure and health surveillance databases and registries to characterize any remaining exposures and risks, to identify any unmet public health needs, and to recommend any steps to further minimize the risks associated with the aftermath of the WTC attacks.

Eleven technical panel meetings and one conference call have been held to date:

- March 31, 2004, at the Alexander Hamilton U.S. Custom House
- April 12, 2004, at the Tribeca Performing Arts Center at the Borough of Manhattan Community College
- May 12, 2004, conference call
- July 12, 2004, at St. John's University
- June 22, 2004, at St. John's University
- July 26, 2004, at St. John's University
- September 13, 2004, at St. John's University
- October 5, 2004, at St. John's University

- November 15, 2004, at St. John's University
- February 23, 2005, at St. John's University
- May 24, 2005, at the Alexander Hamilton U.S. Custom House
- July 12, 2005, at St. John's University

This report summarizes the presentations and panel discussions at the July 12, 2005 technical panel meeting. Information on each of these meetings is provided on EPA's Web site (<http://www.epa.gov/wtc/panel>).

1.1 Panel Attendees

The following panel members were not present at this technical panel meeting:

- Patricia Clark
- Jessica Leighton
- Morton Lippmann
- Steven Markowitz
- Frederica Perera

Richard Mendelson served as an alternate for Patricia Clark, Regional Administrator for Occupational Safety and Health Administration's (OSHA) Region 2 office. Christopher D'Andrea served as an alternate for Jessica Leighton. Mr. D'Andrea is an Environmental Scientist with NYC's Department of Health and Mental Hygiene, Office of Environmental and Occupational Disease Epidemiology. A complete list of WTC expert technical review panel members is available on EPA's Web site (<http://www.epa.gov/wtc/panel/members.html>).

1.2 Purpose and Agenda

The purpose of this technical panel meeting was to:

- Discuss EPA's Final Draft Proposed Sampling Program to Determine Extent of World Trade Center Impacts to the Indoor Environment, review results from the WTC signature validation study, continue discussion of remaining issues associated with the WTC Health Registry, and have opportunity for public comment.

The agenda for this meeting is provided in Attachment A and covered the following topics:

- Welcome, Purpose of Meeting, and Opening Remarks
- EPA Presentation on Final Draft Sampling Plan
- WTC Community/Labor Coalition Presentation
- Panel Discussion
- Morning Public Comment Period
- Update on WTC Signature Study and Discussion
- Update on Building Deconstruction Activities
- NIEHS Presentation on WTC Research Activities: Exposure Assessment and Health Effects
- Afternoon Public Comment Period
- Closing Remarks

2. WELCOME, PURPOSE, AND OPENING REMARKS

E. Timothy Oppelt, EPA Office of Research and Development

Mr. Oppelt introduced himself and welcomed everyone to the eleventh World Trade Center Expert Technical Review Panel Meeting. He thanked the panel members for their hard work and attendance. He reminded everyone that the panel is designed to provide individual comments, rather than achieve consensus on any topic. The WTC panel is not designed to operate like a Federal Advisory Committee Act (FACA) committee. He encouraged the panel members to follow up with written comments and asked them to introduce themselves.

Mr. Oppelt reviewed the agenda and said that the primary goal of this meeting was to re-engage the panel on any remaining issues on the WTC sampling plan and learn what the National Institute of Environmental Health Sciences (NIEHS) research has shown. He commented that the sampling plan is the result of hard work by EPA and productive input from the panel and scientific experts. EPA believes that the plan is scientifically based and will achieve the objectives EPA was asked to determine. Mr. Oppelt reminded everyone that the plan is a *sampling* plan, not a cleanup plan and that the primary purposes are to determine the extent of remaining WTC contamination, provide information for further actions, and offer cleanup, if the levels are above the established benchmarks. He realizes that not everyone will agree with all aspects of the sampling plan. Mr. Oppelt noted that the sampling plan now contains a detailed second course of action if the WTC signature is not validated. Therefore, the plan is no longer dependent on having a validated signature method. The results of the peer review will be used to make decisions about the usefulness of the signature.

Mr. Oppelt noted that because the data are lean, there is much uncertainty about what the results of the sampling might find. To combat this unknown, EPA would like to start sampling as soon as possible, and hopes to finalize the plan in the next 2 to 4 weeks. Dr. Liroy agreed that getting data would help answer some outstanding questions from the community. He views the sampling plan as an iterative process that can be changed as data are collected. He thinks it is critical that the sampling start soon.

Mr. Oppelt welcomed community support and participation. He said that the public has provided a number of useful comments and EPA is pursuing the use of persuasion and help from the community to encourage volunteer participation in the sampling program. The EPA regional office is in the process of hiring a full-time community involvement coordinator to help encourage community involvement and participation.

3. EPA PRESENTATION ON FINAL DRAFT SAMPLING PLAN

Matt Lorber, EPA Region 2

Matt Lorber began his presentation by outlining the major sections of the final draft sampling plan. He reviewed the objectives of the proposed plan and noted that they did not change from the previous version. He also discussed the study design and implementation, assuming there is a valid WTC signature. There will be a separate “test and clean” program if the signature work does not result in a valid WTC signature. As a result of comments made at the last panel meeting, the following changes were incorporated into the study:

- *Benchmarks.* The benchmarks for asbestos and man-made vitreous fiber (MMVF) were reduced from 100,000 fibers per square centimeter (f/cm²) to 50,000 f/cm².
- *Signature.* In the absence of a validated WTC signature, EPA will offer a second “test and clean” program. For those homeowners living within the same boundaries as the 2002 Regional Program, cleanup will be offered if contaminants of potential concern (COPCs) exceed benchmarks. Building owners can request testing of common spaces and heating, ventilation, and air conditioning (HVAC) systems, and cleanup will be offered when appropriate.

The sampling plan now contains an overview of the U.S. Geological Survey (USGS) studies, which established slag wool, gypsum, and elements of concrete as components of the WTC collapse signature. It also shows the preliminary results from the signature validation study.

- *HVAC Systems.* From the draft final sampling plan (6/30/05): “In order to obtain more information about the potential role that HVACs have on air quality and the circulation of COPCs within buildings, whenever a decision to offer a whole building cleanup is borderline and the HVAC contains the WTC signature, multiple air samples will be taken where HVAC outlets discharge into common areas of buildings (near the locations of the dust samples being taken as per the third category of HVAC dust samples noted above). These air samples will be analyzed for concentrations of the COPCs asbestos, MMVF, PAH and lead and the results compared to the air benchmarks in US EPA (2003a).”

One of the comments from the previous panel meeting suggested that benchmarks also be applied to samples from inaccessible areas, as workers could be exposed in these areas. EPA responded that bulk dust samples from inaccessible areas would be measured for COPCs, on a concentration basis. The results will be examined, however, no benchmarks will be developed and applied to inaccessible area samples. Cleanup decisions will be based only on accessible and infrequently accessed areas. Workers and employees may also obtain assistance from OSHA or the National Institute for Occupational Safety and Health (NIOSH) as it relates to concerns from exposure to WTC dust in their working environment. EPA will service commercial buildings and units where access is provided in accordance with the final sampling plan.

Mr. Lorber presented the following schedule of events:

- Peer review of signature—as soon as the panel provides input on the charge memo
- Procure contracts and recruit buildings—within 7 months
- Finish initial sampling—13 months after the decision is made to proceed
- Finish cleaning—15 months after the decision is made to proceed
- Decisions on Phase II—18 months after the decision is made to proceed

David Newman suggested that the objectives be revised to say “to estimate the geographic extent of remaining WTC contaminants of potential concern.” A community member suggested that the title also be revised accordingly.

4. **WTC COMMUNITY/LABOR COALITION PRESENTATION**

Catherine McVay Hughes, Community Liaison

Micki Siegel de Hernandez, Labor Liaison

Catherine McVay Hughes and Micki Siegel de Hernandez presented a report reflecting the results of WTC Community-Labor Coalition (CLC) meetings held on June 22, 2005, and July 6, 2005. Ms. McVay Hughes began by saying that the revised plan “is a profound disappointment as it fails to incorporate the vast majority of requests made by the WTC Community-Labor Coalition and panel members at the May 2005 panel meeting.” EPA did not address the following requests made by the WTC CLC:

- *Access.* Do not leave decisions about access to building owners and managers. Workers and residents should have the right to volunteer to have their workplaces and homes sampled. Collect information on buildings that refuse to volunteer to determine participation bias. Create a participation task force to explore legal rights of access and ways to maximize involvement.
- *Geographic Areas for Sampling.* Use a more inclusive set of photographs that show the dust and fire plumes and secondary sources of contamination over time, as well as other indicators such as documented health effects.
- *Sampling Design.* Provide statistical calculations used to determine sample size, power, error rates, etc. Provide support that it is appropriate to use the spatially balanced sampling methodology in the urban NYC environment.
- *COPCs.* Return silica to the list of COPCs and add mercury and dioxin to the list.
- *Accessible, Infrequently Accessed, and Inaccessible Locations.* Redefine the terms. More weight should be given to the infrequently accessed and inaccessible locations, as these areas are most likely to harbor remaining WTC contamination and are accessed by thousands of workers on a daily basis. Collect and analyze samples from inaccessible locations separately.
- *Cleanup Benchmarks.* Apply the same benchmarks for accessible locations to all other locations.
- *HVACs.* Collect more samples from HVAC units and analyze them separately to identify contaminated locations. Use the sampling results to determine whether HVAC units should be cleaned, and give more weight to these results in the decision to offer building cleanup.
- *Soft Surface Testing.* Evaluate and compare more suitable methods already demonstrated to be effective for capturing lead and polycyclic aromatic hydrocarbons (PAHs) in soft surfaces.

- *Signature Research and Peer Review.* Operate the peer review as a full and transparent public process. Ms. Siegel de Hernandez reported that Senator Clinton requested that the approach, data, and methods underlying the entire signature design and development be subjected to a peer review process that affords the opportunity for public input.

Ms. Siegel de Hernandez also criticized EPA's test and clean program, in the absence of a validated signature. She pointed out that there is "**NO** 'Plan B' for workers if there is no signature." The suggestion to file a complaint with OSHA or request a Health Hazard Evaluation (HHE) from NIOSH is "completely inappropriate" because (1) EPA's sampling program and an OSHA complaint or NIOSH HHE are not comparable, (2) OSHA and NIOSH cannot address the problem of testing and cleanup of WTC contamination, (3) there are no OSHA standards that apply to this situation, (4) workers can only file an OSHA complaint against their employers, not the buildings they work in, (5) NIOSH does not conduct cleanup, and (6) NIOSH HHE's are voluntary and their recommendations are not enforceable.

Ms. McVay Hughes pointed out that (1) EPA has not discussed the steps it will take to ensure adequate sensitivity of test results and (2) the quality assurance/quality control plan fails to include an independent monitor on behalf of the affected community of residents and workers. She also listed the WTC-related demolitions that continue to concern the community.

In conclusion, Ms. Siegel de Hernandez said that the draft final sampling plan still contains "fundamental, serious flaws" that can be corrected. The WTC CLC continues to be committed to working with EPA to correct these flaws and salvage the program.

5. PANEL DISCUSSIONS

5.1 WTC Proposed Sampling Program: Success Requires Restructuring of Program Objectives and Sampling Methodology

David Prezant, New York City Fire Department

Jeanne Stellman, Mailman School of Public Health at Columbia University

At the beginning of the morning panel discussion, David Prezant and Jeanne Stellman asked to present a brief presentation with their suggestions for restructuring the sampling plan's objectives and methodologies. Prezant began by saying that they support many aspects of the plan, but believe there should be some fine-tuning, especially in the objectives.

- *Revised Objective One.* Focus on the sampling to determine the geographic extent of remaining WTC contaminants (Phase I). Try to maximize participation and minimize the built-in bias by offering cleanup to all units that participate in the initial sampling, if they have COPC exceedances, regardless of the presence of the WTC signature.
- *Revised Objective Two.* Build in the constraints of building type and HVAC role into the sampling design. Do not re-sample units that were cleaned during Phase I.

- *Revised Objective Three.* After collecting initial sampling data, validate a screening method to identify WTC dust. This will provide necessary data to inform policy decisions for further testing and cleanup in Phases II and III.
- *Revised Objective Four.* Use the results of Phase I sampling to determine whether cleaning should proceed during Phase II. Phase II should test for the presence of collapse residues in additional units within the same geographic area as Phase I. The purpose is to determine whether further sampling is necessary in this already sampled geographic area. Perhaps cleaning of like units would be offered and could proceed without sampling.
- *New Objective Five.* Initiate Phase III to sample and test for the presence of collapse residues in areas beyond the geographic boundary of the areas sampled during Phase I.

Stellman commented on the proposed statistical sampling model (i.e., spatially balanced sampling). She read the Stevens and Olsen (2004) paper and believes that spatially balanced sampling is inappropriate for this analysis because the WTC area has distinct natural units and cannot be viewed as an infinite point set, which is required by the model. She said that self-selection is a driving force and the current model has inherent misclassifications in the building categories (confirmed-breached, confirmed-unbreached, etc.). She firmly believes that the variables should be controlled for in the design phase. The current plan is setting up a “nightmare” policy scenario for any secondary evaluation (e.g., attributing lead to peeling paint). She commented that these suggestions are not a revision of the entire plan, just a revision of the procedure for building selection. Stellman suggested forming a sampling subcommittee, consisting of technical panel members, statisticians, environmental sampling experts, and community representatives to design an appropriate sampling strategy that takes the known variables into account.

In response to a question from Oppelt, Prezant explained that Phase I would sample a limited number of units within the geographical boundaries already defined, and offer guaranteed cleanup only to those units. He clarified that the commitment would be made only to the individual unit, not for the entire building. Phase II would decide whether additional units should be sampled and cleaned. Krish Radhakrishnan noted that if the EPA’s proposed sampling strategy is used, then thousands of units could be involved.

Lioy was concerned that there could be a scenario in which lead was found in a unit, no WTC signature was found, but the unit was cleaned anyway. A neighbor who was not tested would also want their unit tested and cleaned. He thinks there will be a problem with cleaning units where the WTC signature was not found. Prezant talked about setting certain boundaries. He noted that he has always supported the use of a WTC signature to trigger cleanup, however, he also realizes that there needs to be a way to limit selection bias.

Oppelt said that there could be a prospect of biasing the results in the opposite direction—self-selection of units known to have lead paint or open windows. Prezant suggested not allowing units with certain criteria to volunteer. Stellman clarified that units with certain characteristics would be sought after.

Henry Kahn, an EPA statistician, said that Dr. Olsen, an EPA statistician with the Office of Research and Development laboratory in Corvallis, Oregon, is a leading expert on the theory and implementation of spatially balanced sampling designs. Dr. Olsen has agreed to draw a spatially balanced sample for this study and would not do so if he thought it was inappropriate. Kahn suggested that Stellman talk to Dr. Olsen, who is very accessible and always willing to talk about applications of spatially balanced sampling. Kahn noted that spatially balanced sampling is appropriate in situations (such as sampling buildings in New York) where sample units are distributed over a defined area. Kahn also noted that the spatially balanced technique is unique in that it can select additional units if the initial units refuse to participate, and still maintain a sample with the spatially balanced property. Stellman commented that not many buildings in the WTC area are interchangeable. She continued to be skeptical that spatially balanced sampling is applicable to the WTC scenario.

5.2 OSHA's Role in Worker Exposure to WTC Contamination

Richard Mendelson, OSHA

During the morning panel discussion, Oppelt asked Richard Mendelson to briefly discuss OSHA's role in protecting employees' health. Mendelson said that OSHA would respond to worker complaints with on-site inspections of the employees' work sites. He noted that OSHA has the right to inspect any workplace and can seek a search warrant if entry is denied. OSHA would conduct personal air sampling of the employees' breathing zone for airborne contaminants, and compare these levels to permissible exposure limits (PELs), which are designed to protect the worker over an 8-hour work day, 40-hour work week, over a career. Abatement would not be required if the levels are below PELs. Employers would be held responsible if the levels are above the PELs. They would be required to provide some level of protection to their employees. OSHA's role is strictly regulatory and enforcement. There is no mechanism for funding for employers to come into compliance.

Mendelson also summarized Patricia Clark's response about the applicability of OSHA's Hazardous Waste Operations and Emergency Response (HAZWOPER) 29CFR1910.120 standard. In short, 1910.120 does not apply across the board to the WTC cleanup operations. There are five triggers for 190.120: 1) cleanup operations for uncontrolled hazardous waste under Superfund, 2) cleanup actions under RCRA, 3) voluntary cleanup operations recognized by federal, state, or local bodies at uncontrolled hazardous waste sites, 4) cleanup operations at treatment and storage disposal facilities, and 5) emergency response to a release of hazardous substances. He noted that there could be distinct operations that would trigger 1910.120. However, even though 1910.120 is not the governing standard, if employees are being exposed to a serious hazard, then OSHA will respond under the general duty clause.

In response to a question from Oppelt, Mendelson walked through the steps expected to be taken for a hypothetical complaint. First, there would be a conference with the employer. Then OSHA would shadow the employee and conduct personal air sampling. The industrial hygienist might also collect bulk samples for laboratory analysis. Time-weighted averages (TWAs) would be calculated. If less than 8 hours of samples are collected, a zero is substituted. If the TWAs exceeded the PELs, the employer would be required to provide some level of protection to the employee. The preferred method of protection would include elimination, substitution, or

engineering controls, followed by administrative controls, with personal protective equipment being the least desirable option.

Siegel de Hernandez commented that air sampling had been dismissed at previous panel meetings as inappropriate because contaminants are settled in the dust. She is confident that if an employee filed a complaint, and OSHA sampled, the air levels would not exceed the PELs. The purpose of EPA's sampling is to discover contamination. It is highly unlikely that an OSHA inspection would result in cleanup. Further, the citation would be against the employer, who has no influence over whether the building will be cleaned.

Newman said that EPA's current sampling plan sets a double standard for workers when compared to all other occupants. It is inappropriate to not afford workplaces and employers the same benefits and additional protections that are being offered for residences. He does not think that OSHA can provide the same level of protection because the WTC situation is not a good regulatory fit.

Lioy asked Newman whether he could envision a scenario that would start the process for OSHA to come and investigate whether there is an exposure or health hazard occurring. Newman responded that he could think of two scenarios, however, OSHA cannot offer the same level of protection that EPA can offer. EPA has been tasked with determining where remaining WTC contamination is located, and cleanup where needed. The current sampling plan does not allow a significant number of people to benefit from the higher level of protection that EPA can offer them.

Oppelt pointed out that the PELs are risk-based standards. He said it is important to understand that the COPC benchmarks are extremely conservative and are not health-based. To use a health-based relationship, EPA would need to conduct air sampling, however, that was rejected by the panel and the community. Siegel de Hernandez replied that the community is not suggesting that the same OSHA standards be applied to residents, rather the same EPA standards for residents be applied to workers. If OSHA could have addressed the problem, the employees would have pursued that avenue long ago.

5.3 NIOSH's Role in Worker Exposure to WTC Contamination

Bruce Bernard, NIOSH

During the afternoon session, Oppelt asked Bruce Bernard from OSHA's Cincinnati office to talk about the authority NIOSH has to address worker safety issues. Bernard said that NIOSH is one of the Centers for Disease Control and Prevention (CDC). It is a public health research agency, not an enforcement agency. NIOSH conducts occupational health and safety research and workplace evaluations as part of the HHE program. The HHE program is based on federal regulation code 4285, which states that workers have a right to know if they are exposed to chemical hazards or physical agents at specific work sites. Specific work site evaluations can be conducted at the request of the employee, the union, or the employer. NIOSH has the same right-of-entry as OSHA; therefore, HHEs are not necessarily voluntary. HHEs are epidemiological and hygiene evaluations of specific work sites that result in non-binding health and safety recommendations based on the appropriate occupational and health and safety criteria.

The recommendations would be provided to the employer, as well as the employee and union. The same hierarchy of controls that apply to OSHA also apply to NIOSH—substitution, engineering controls, administration controls, and personal protective equipment. NIOSH does not conduct cleanup. The HHE program has not been given resources to address the issues mentioned today. NIOSH would be able to respond to WTC-related requests as part of their regular work. NIOSH conducts about 80–100 work site visits and 320 consultations a year.

Newman asked about NIOSH’s ability to respond to a potentially large number of requests. Bernard responded that NIOSH would most likely sample a representative number of work sites and from those make a determination and offer specific recommendations that can also be generalized to other workplaces. NIOSH’s ability to respond would be less than EPA’s.

6. UPDATE ON WTC SIGNATURE STUDY AND DISCUSSION

Jacky Rosati, EPA National Homeland Security Research Center

Jacky Rosati reviewed the hypothesis for the WTC collapse screening method—if a unit has been impacted, those materials that are found in WTC dust (i.e., slag wool, elements consistent with concrete, and gypsum) will be found in the dust collected from the unit. If a sample does not contain “significant” levels of slag wool, the unit would not be considered to contain WTC residuals. Gypsum and elements consistent with concrete would be used as secondary confirmation of the presence of WTC dust.

Samples of WTC dust and background locations were collected. Background dust was spiked with three levels of WTC dust (1%, 5%, and 10%). For the method validation study, eight laboratories (five commercial and three government laboratories) were given six blind spiked samples and 10 blind background samples, in duplicate, for analysis. Due to the difficulty in homogenizing dust containing large fibers, the spiked samples showed varied levels of slag wool.

Dr. Rosati presented several figures visually displaying the preliminary results, which indicate that slag wool is a good screening material to identify WTC dust. A limit for slag wool could be established for screening purposes. Any unit with slag wool concentrations above this level (as yet undetermined), as well as a COPC exceedance, will be offered cleaning. Dr. Rosati explained the rationale behind choosing one screening limit over another, while ensuring minimal or no false negatives and keeping a reasonable level of false positives. The preliminary results also showed that there does not appear to be a distinguishable difference in levels of concrete and gypsum between background and WTC dust. There is high variability both within laboratories and between laboratories. Despite this variability, the method of using slag wool appears to be sensitive enough to distinguish at least 10 percent WTC dust from background. Additional evaluations will be performed to understand the variability and perhaps reduce it.

The study design and results will be subjected to an external peer review. Based on comments from the peer review and the panel, EPA will decide whether the WTC screening method is a valid method for determining whether residual WTC dust contamination is present in a unit.

In response to several questions from panel members, Dr. Rosati clarified that the samples from 4 Albany Street were carpet, HEPA vacuum samples. The closest samples to the WTC were collected from 4 Albany Street and the Deutsche Bank. Samples were also collected from Governor's Island, the EPA building at 290 Broadway, New Jersey, and White Plains. Samples were collected from both commercial and residential vacuum cleaner bags, as well as from HEPA vacuums used by EPA contractors. Several background samples from a single source (maid service in Queens) were added together to make a composite for spiking. One laboratory analyzed the 28 remaining background samples that had been collected for slag wool, gypsum, and elements of concrete, in order to further validate the signature by determining whether these components existed at levels in background dust that were distinguishable from WTC-impacted dust.

Discussion

In response to a question from a community member, Oppelt said that the purpose of the signature study was to determine whether it is possible to distinguish WTC dust from background. Greg Meeker also noted that the study was designed to demonstrate that the laboratories could measure WTC dust. Meeker suggested that the study was not designed to determine what the slag wool limit should be. He said that the data collected during Phase I will provide the information needed to make those kinds of determinations.

Marc Wilkenfeld commented that it was more important to focus on being able to identify false negatives, rather than false positives. Rosati replied that EPA's goal is to achieve zero false negatives. Wilkenfeld also said that he is most concerned about health effects. Oppelt replied that there are no health effect levels for slag wool. The levels found in the dust will be used to determine whether the dust has been impacted by WTC contamination.

Lioy mentioned that whichever laboratory is chosen would need to have tight variability to reduce the possibility of error. McVay Hughes stated that the two laboratories that provided unacceptable data should be disqualified from doing the WTC analyses.

McVay Hughes wanted to know what the deposition rate was to determine how much dilution occurred over time. Lioy replied that because there are so many variables, that would be extremely difficult to measure.

A community member pointed out that this study does not prove that slag wool will be present in areas impacted by WTC contamination. There is a lack of sampling at 1, 2, and 3 kilometers from the WTC. Meeker agreed that this study did not measure how far slag wool traveled. He said that additional data need to be collected before this determination can be made. Now that a method has been established, sampling can proceed. Lioy pointed out that Governor's Island is about 1.4 miles from the WTC and had the highest levels of slag wool. He stressed the importance of sampling residences and buildings as soon as possible and hopes that the community will help encourage participation. One community member expressed her dilemma with volunteering to participate, not knowing whether slag wool can be a reliable test for WTC contamination. The community does not want to participate without a validated WTC signature.

Lioy asked Meeker if he thought that the study was rigorous enough to make a determination of whether slag wool is a good indicator of WTC dust contamination. Meeker replied that slag wool is a good indicator. However, additional data need to be collected before it can be fully understood how slag wool behaved. Given the Governor's Island sample, it seems that slag wool would be a good indicator out to about 1.5 miles. It might even be a good indicator farther out. Pat Evangelista asked for confirmation that slag wool could be used as an indicator for WTC contamination, as well as determine the geographic extent of the dust plume. Lioy replied that it would be an indicator of the dust plume, as long as enough samples are collected. He again stressed the importance of getting samples to see how far the plume extended. Meeker responded that a validated method for analyzing the dust is close to being established, there is good evidence that slag wool will travel at least 1.5 miles (based on one sample), and now additional samples need to be collected to see if the theory holds true. He further stated that samples collected within a half mile from the WTC looked the same. He is confident that the signature is not going to change within a half mile; however, he is less comfortable with a 1.5-mile circumference since there is only one sample. Evangelista noted that the level of slag wool is expected to change with some unknown distance.

One community member said that EPA has been putting the cart that links the cleanup decisions before the horse of gathering actual data. Residents and workers are in a dilemma. She cannot encourage residents to participate in the program because at this moment, slag wool is not a validated trigger for WTC contamination. It is still an unproven hypothesis and should not be linked to the decision for cleanup. The community is also concerned that COPCs may have traveled farther than slag wool. Siegel de Hernandez clarified that the community also agrees that additional data need to be collected. She thinks that there will be a signature over distance and time. However, the program cannot ask people to volunteer for sampling when the triggers for cleanup have not been determined. The WTC signature should not be linked to the policy decisions about whether cleanup is going to be offered. Stellman asked whether it was out of the realm of possibility to establish an agreement, without establishing a precedent, that apartments that are sampled and found to contain COPC exceedances be cleaned.

Oppelt ended the discussion with a reminder for McVay Hughes and Siegel de Hernandez to provide names of experts they would like the contractor to consider for peer reviewing the WTC signature method.

7. AN UPDATE ON THE WORLD TRADE CENTER HEALTH REGISTRY: POST-ENROLLMENT ACTIVITIES

Lorna Thorpe, New York City Department of Health and Mental Hygiene (NYC DOHMH)

Lorna Thorpe began her presentation by describing that the WTC Health Registry is a surveillance tool to document and evaluate the public health impact of the WTC disaster on large and diverse populations. Containing over 71,000 enrollees, it is the largest health registry in the world. She highlighted the role and objectives of the WTC Health Registry.

Preliminary health findings indicate that more than half of the adult enrollees (54%) reported new or worsened respiratory health symptoms following 9/11/2001. At the time of the interview (2–3 years after the event), adult enrollees reported higher rates of psychological distress than the

citywide average. More information can be found on the WTC Health Registry Web site: www.wtcregistry.org.

Dr. Thorpe described the post-enrollment activities and highlighted the main activities for each:

- *Preparing and Analyzing Data.* Papers in preparation include surveillance for injuries and physical health effects among WTC tower survivors, prevalence of probable post-traumatic stress disorder (PTSD) among residents, prevalence of probable PTSD among WTC tower survivors, and asthma and mental health distress among children.
- *Building Productive Relationships With Advisory Groups.* The Community Advisory Board, the Labor Advisory Committee, and the Scientific Advisory Committee provided input and advice. The WTC Health Registry has adopted several of their suggestions.
- *Updating Enrollee Contact Information.* An annual letter was sent to all enrollees in January 2005, requesting updated contact information. Thousands of people have also provided updated contact information through the Web site, phone calls, and e-mails.
- *Establishing a Mechanism to Review External Research Requests.* Most enrollees provided consent to receive information about external studies. Guidelines and a review committee have been established to review and score research applications.
- *Preparing a Long-Term Follow-Up Strategy.* The NYC DOHMH plans to trace participants through national mailing databases, telephone databases, and other electronic databases; follow up with brief health surveys every 2 years; distribute newsletters, annuals cards, and e-mails to inform enrollees and sustain interest; and promote registry access to external scientific proposals.
- *Developing a Follow-up Questionnaire.* The draft questionnaire includes the following topics: general health, physical health symptoms and conditions, alcohol and tobacco use, mental health status and social support, additional questions on dust cloud exposure, union membership, and health utilization practices. It also includes questions for residents about cleaning and questions for occupants of buildings on evacuation and cleaning.
- *Creating a Public Use Dataset.* To protect confidentiality, the data will be de-identified. Release of a simple query-based system on the Web site is scheduled for early 2006. A downloadable dataset and resources will be available later.
- *Providing General Information to Enrollees and the Public.* The NYC DOHMH uses the Web site, quarterly newsletters, a resource guide, press releases, and e-mails to provide information to the enrollees.
- *Developing Treatment-Related Resources.* An updated resource guide was released in June 2005. Physician guidelines are scheduled to be released in fall 2005.

- *Responding to Individual Queries from Enrollees.* About 500 enrollees have asked the question: “Is my health problem related to 9/11?” Around 325 enrollees have asked “Where can I go for medical treatment or for health with mental health issues?”

Future plans include securing long-term funding for the WTC Health Registry, maintaining long-term relationships with enrollees, and expanding the research at NYC DOHMH and by external researchers. The limitations of the WTC Health Registry include the fact that not all affected groups were eligible for enrollment, the baseline survey had several limitations, and routine follow-up surveys will be based on self-reporting. The strengths of the WTC Health Registry are that a large, defined population of affected individuals with diverse exposures has been established, many enrollees were recruited from lists with known denominators, routine assessments of enrollees will be obtained, the registry is a roster of individuals from which subgroups may be reached for specialized studies, and the registry is accessible to external researchers.

Discussion

McVay Hughes asked several questions, which were answered as follows:

- While it is an option, the Community Advisory Board has not decided to have a meeting open to the public yet. Thorpe suggested that community members reach out to advisory board members, whose names are listed on the WTC Health Registry Web site.
- The Community Advisory Board voted which member they wanted to represent them on the External Research Review Committee.
- Certain health conditions recorded from the baseline survey provided strong enough information to be notable. However, other conditions, such as respiratory effects, may require specialized studies.
- If an entity wants to conduct a study, they must secure their own funding, but funding need not be established before submitting a proposal to the NYC DOHMH.
- In general, more research has been conducted on workers than residents. The Registry allows opportunities to examine health conditions among residents.

McVay Hughes suggested adding the asthma database to those being considered for cross-referencing. She also requested that information on thyroid issues be collected on the next survey.

8. UPDATE ON BUILDING DECONSTRUCTION ACTIVITIES

Pat Evangelista, EPA Region 2

Pat Evangelista provided an update on EPA Region 2’s involvement in the monitoring of demolition activities at the following five buildings:

- *130 Liberty Street (former Deutsche Bank)*. EPA sent a comment letter to the unit owner on January 31, 2005. The owner sent a variance request to New York State Department of Labor on April 13, 2005, and received conditional approval on May 11, 2005. EPA received revised sections of the plan on May 12, 2005, and immediately distributed the revisions to its regulatory partners. On June 14, 2005, EPA received additional revised documents from the unit owner and is currently reviewing all documents. EPA expects to provide another comment package to the unit owner by the end of July.
- *130 Cedar Street*. EPA provided comments to the unit owner and consultants on May 11, 2005. To date, EPA has not received a response.
- *133-135 Greenwich/Thames*. The owners submitted preliminary plans on June 10, 2005. Based on discussions later that month, the owners submitted revised plans. EPA is currently reviewing the documents and will prepare a comment package to deliver to the owners.
- *Fitterman Hall*. EPA had a follow-up meeting with the building representatives on July 5, 2005. The variance request was approved by the New York State Department of Labor. Over the next couple of months, the building representatives will be characterizing the building conditions and will submit a plan to EPA by early fall.
- *4 Albany*. Demolition of this site is substantially underway and is expected to be completed in the next couple of months.

Discussion

McVay Hughes reminded everyone that there is much potential for recontamination during demolition activities.

In response to questions from Newman, Evangelista explained that all submittals are publicly available and are posted to the WTC Web site (http://www.epa.gov/wtc/demolish_deconstruct/index.html). He noted that the contamination at Fitterman Hall appears to be consistent with contamination at 130 Liberty Street. WTC dust is present in the buildings. The assumption is that all COPCs are present; therefore, the proper monitoring and containment will be applied.

Apparently 130 Liberty Street is not going to be completely demolished. Instead, the owners intend to remove a portion of the façade. Because the renovation is intrusive enough to pose a concern, EPA plans to track this building the same as the others.

To help prevent impacted buildings from being demolished without regulatory oversight, EPA provided their list of 53 confirmed breached buildings to the NYC Department of Buildings. The understanding is that the NYC Department of Buildings will flag those buildings to the NYC Department of Environmental Protection, who will have discussions with EPA and make decisions on a case-by-case basis. The greater focus is on those buildings that have been impacted, but are uninhabited and remain uncleaned.

A community member asked EPA to look into potential contamination in the transit systems and the potential release of “perc” at these demolition sites. Evangelista replied that the demolition methods and monitoring are designed to monitor all potential releases. He promised to look into the issue further.

A community member mentioned that the building at 130 Cedar Street has open windows. Evangelista confirmed that the building’s windows should be closed, and that EPA has had some difficulties with the building owner. Radhakrishnan talked to the building owner on Friday, who promised to have the windows closed by Wednesday.

9. NIEHS PRESENTATION ON WTC RESEARCH ACTIVITIES: EXPOSURE ASSESSMENT AND HEALTH EFFECTS

Claudia Thompson, National Institute of Environmental Health Sciences (NIEHS)

During her search for WTC-related articles in PubMed, Claudia Thompson found 66 health studies and 20 exposure assessment studies. Of the health effects studies, 42 articles addressed issues concerning the general population and 24 articles addressed issues related to workers. She highlighted a few published exposure assessment activities, including sampling analyses and exposure models. Dr. Thompson then discussed the results from two key human health effects studies on the general population and one worker study.

- *WTC Resident Respiratory Impact Study to Examine Prevalence for Respiratory Symptoms.* The results indicated a statistically significant increase in new-onset respiratory symptoms in previously normal residents when compared to the control population.
- *An Epidemiological Study of Pregnant Women and Children to Assess Pregnancy Outcome and Relationships to Fetal/Child Development.* The results showed a two-fold increased risk of having a birth weight below the tenth percentile for gestational age. Babies of mothers who resided within 2 miles of the WTC had a decrease in birth weight and length. A decrease in head circumference was seen in babies born to women who were in their first trimester at the time of the collapse. Lower cortisol levels were also seen in mothers and babies of mothers who developed PTSD in response to 9/11. Detectable PAH-DNA adducts were observed in maternal blood and cord samples. However, there appears to be no significant relationship between adduct levels and exposure index, and no significant association between metal biomarkers or organochlorines and exposure index or timing of blood draw.
- *Respiratory Symptoms and Psychological Health Assessment of WTC Workers.* The results indicated that WTC workers were at greater risk for all lower respiratory symptoms when compared to workers who were never at the disaster site. Preliminary results indicate that there was a significant prevalence of PTSD and depression in WTC workers when compared to those who were never at the WTC.

Dr. Thompson noted that very few studies are trying to understand the mechanisms of action for the health effects being seen. There is also conflicting information, making it difficult to write an overall assessment at this time. She ended the presentation by highlighting a few areas that require additional evaluation: pulmonary disease in the general population and workers, exposure to airborne dioxins and furans, and long-term adverse effects on children born to mothers exposed to WTC contamination.

10. PUBLIC COMMENTS

A public comment session was held from 11:13 a.m. to 12:20 p.m. (scheduled from 11:00 a.m. to 12:00 p.m.) and from 4:18 p.m. to 5:40 p.m. (scheduled from 4:00 p.m. to 5:00 p.m.). The following members of the public made comments to the panel during this period:

- Ann Arlen
- Lisa Baum
- Linda Belfer
- Betty Brassell
- Patricia Dillon
- Michael Edelstein
- Kimberly Flynn
- Robert Gulack
- Deb Hanna
- David Dyssegaard Kallick
- David Kotelchuck
- Rachel Lidov
- Stan Mark
- Caroline Martin
- Suzanne Mattei
- Jenna Orkin
- Mary Perillo
- Jo Polett
- Esther Regelson
- Alex Sanchez and Manuel Checo
- Joel Shufro
- Pete Sikora
- Jeffrey Smith
- Paul Stein
- Vivian Wynne

Comments received in writing are provided in Attachment B.

At the end of the scheduled public comment period, additional community members asked several questions. The following are some highlights from that discussion between EPA and the community:

- Lockheed Martin is the contractor that collected dust samples.
- EPA will not assume that buildings neighboring the 53 confirmed breached buildings are not contaminated. The intention of the sampling plan is to draw conclusions about a certain area from a representative number of buildings in that area.
- The community is disappointed that the signature study peer review is not a public process.
- Lioy feels strongly that there is enough information on the signature for sampling to begin. The plan can be adjusted as data are collected and analyzed.
- The community also wants sampling to begin, however, they feel that there are serious flaws with the current plan that will lead to finding contamination, but then not doing anything about it. They also want more data collected, but not with an inappropriate sampling plan.

- Panel members disagreed on the way the discussion about unmet public health needs was initiated. Some felt that EPA was being responsive to the community's request to address unmet public health needs. Others felt that there should have been more time in the agenda to discuss the proposed sampling plan.
- Stellman commented that there is a lot of frustration and misinterpretation during these panel meetings. She suggested hiring a facilitator.
- EPA anticipates that the signature will be used as a tool in the sampling plan, if it can be demonstrated to be a viable method.
- One community member suggested delaying the decision for validating the signature until enough data can be collected to make an informed decision.
- One community member is afraid that EPA will have authorized the implementation of the plan without having the community's support.
- EPA has made honest attempts to convene separate meetings with the community and is doing what they can to engage the community.

11. CLOSING REMARKS

Oppelt said that the peer review charge questions will be sent to the panel members for their review. He encouraged interested parties/community to nominate candidate reviewers they would like the contractor to consider for the review. The contractor will consider nominations sent by July 22, 2005. Oppelt noted that EPA hopes to finalize the sampling plan as soon as possible. He acknowledged that there are aspects of the plan that the community has not accepted. However, EPA thinks the plan is scientifically acceptable and will accomplish the intended goals. Oppelt thanked the panel members, as well as the community, for attending the meeting and providing comments. He encouraged panel members to submit additional written comments on Prezant's and Stellman's suggestions.